

**COOPERATIVE MOBbing OF THREE PASSERINES SPECIES  
ON RED SQUIRREL (*Sciurus granatensis*) (RODENTIA, SCIURIDAE)**

**ACOSO COOPERATIVO DE TRES ESPECIES DE PASERIFORMES SOBRE LA  
ARDILLA ROJA (*Sciurus granatensis*) (RODENTIA, SCIURIDAE)**

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**Abstract**

Mobbing is a well recognized anti-predator bird behavior in which by using stereotyped movements and repeated calls, two or more individuals try to drive away a predator. In this note, it is reported the cooperative mobbing between two tyrannid species and a Black-billed Thrush on a Red Squirrel, which predated a Rusty-margined Flycatcher nest. The causes for this joint are also discussed.

**Key words:** bird's behavior, parental care, animal altruism.

**Resumen**

El acoso cooperativo es reconocido como un comportamiento antipredador de aves en el cual dos o más individuos tratan de mantener alejado a un depredador mediante movimientos estereotipados y vocalizaciones. En esta nota se registra el acoso cooperativo entre dos especies de tiránidos y un tordo sobre una ardilla roja, la cual había depredado un nido de atrapamoscas de pecho amarillo. También se discuten las causas de este despliegue.

**About mobbing and an uncommon observation**

Mobbing is a well recognized bird behavior which consists on the performed joint assault of these prey individuals on a predator in an attempt to disable or drive it out from the vicinity (CURIO, 1978; DOMINEY, 1983, ARNOLD, 2000) by emitting repeated, loud and easily localizable calls, and performing stereotyped movements that quickly recruit more prey individuals around a predator (CURIO, 1978; DOMINEY, 1983) in a cooperative action. Mobbing cooperation can be carried out by conespecific or heterospecific individuals. There are successful experiments that explain the possible origin of bird mobbing (KRAMS *et al.*, 2006) but the prevalence of cooperation between unrelated individuals continues to be a major unresolved question in

evolutionary biology (WHEATCROFT and PRICE, 2008). Nevertheless, information about mobbing in Neotropical birds is scant (CASTRO-SIQUEIRA, 2010) and in order to contribute to the knowledge and understanding of heterospecific mobbing with non experimental observations, this paper reports the heterospecific mobbing of Great Kiskadee *Pitangus sulphuratus*, Rusty-margined Flycatcher *Myiozetetes cayanensis* and Black-billed Thrush *Turdus ignobilis* on a *Sciurus granatensis* red squirrel, while it predated the *M. cayanensis* nest.

On May 2012, at approximately 14:00Hrs an individual of *P. sulphuratus* was observed performing repeated vocalizations to warn the presence of a female red squirrel (*S. granatensis*) on the ground, near the tree (about 25mts) where the bird was perched. A few minutes later, the rodent started to climb up the tree where *P. sulphuratus* was, immediately a pair of *M. cayanensis* joined with repeated calls. When the squirrel had climbed about three meters from the ground, a pair of *P. sulphuratus* started a non simultaneous flying graze over the squirrel, while the possible mate, as well as the *M. cayanensis* couple made calls from their respective perch.

This mobbing behavior was poorly effective: the squirrel kept searching around for five minutes and only stopped when *P. sulphuratus* flew close to it. When *S. granatensis* found the *M. cayanensis* nest and was going towards it, an individual of *T. ignobilis* perched in front of it and started to make repeated calls and wing movements, showing more aggressive behavior than the other two tyrannid species. The squirrel stood still for a while, but when it slipped away to the nest, *T. ignobilis* left the perch and stopped its mobbing, then *S. granatensis* started to eat the eggs from the *M. cayanensis* nest. The squirrel ate while the birds just made advisement calls. *P. sulphuratus* showed a more aggressive behavior than *M. cayanensis*, flying close to the squirrel (less than 20 cm) making it stop for a few seconds, even to cause the fall of one of the eggs on which the squirrel was feeding. This was ineffective because the squirrel simply took another egg and continued her feeding. In all, *S. granatensis* ate three eggs from the same *M. cayanensis* nest, and when finished, quietly descended from the branches, and the mobbing ended.

### **Different Species, Different explanation**

The first calls made by *P. sulphuratus*, when the squirrel was about 25 meters away shows a strong predator-recognition which means that squirrels are important nest predators (MARTIN, 1988). In this case, *S. granatensis* was the stimulus for the three different bird species to form a complex mobbing behavior. *P. sulphuratus* had the longest mobbing action; however, the

predation was focused on a *M. cayannensis* nest, one possible explanation for the cooperation of *P. sulphuratus* to support *M. cayannensis* is that *P. sulphuratus* had a nest in an adjacent tree.

Accordingly with the hypothesis shown by OSTHREIHER (2003), the *M. cayannensis* behavior could be explained as a part of its parental care: their offspring were under threat and *M. cayannensis* mates tried to carry the predator away. It's the same case for *P. sulphuratus* that was a *M. cayannensis* neighbor. Its behavior, however, shows different stages throughout the mobbing: First, according to CURIO (1978), *P. sulphuratus* showed a "perception advertisement", making vocalizations when the predator was several meters away and was just starting to come near the tree, however, the vocalization was not effective and the predator kept moving toward the nest, after which, the behavior of *P. sulphuratus* can be described as that of parental care (same situation of *M. cayannensis*). But when the squirrel focused on the *M. cayannensis* nest, the behavior of *P. sulphuratus* became altruistic, endangering itself for the sake of their nest and their neighbors.

This behavior possibly was based on reciprocal altruism. The possibility of reciprocity among individuals belonging to different species can be admitted since many animals live in multi-species groups and they may benefit from the anti-predator behavior of other species (FORSMAN *et al.*, 1998 *a,b*) and even more if the interspecific reciprocity is based on breeding interspecific recognition and temporal stability (KRAMS *et al.*, 2006), which was possibly the case of the two tyrannid species nesting in a common zone.

On the other hand, *T. ignobilis* was from an anonymous community and its behavior was totally altruistic. In fact, the observations cannot explain *T. ignobilis*'s mobbing behavior in terms of reciprocal altruism because it was a transient bird which joined the mobbing for a few seconds and after that, it left the mobbing aggregation.

Birds will often respond by contagion to the reaction of other birds and this is the basis of large aggregations found sometimes around predators. Part of the reason for this contagion is the similarity in duration and frequency of mobbing calls by different bird species (SMITH, 1965), and it may explain why *T. ignobilis* joined the mobbing, considering it was an external individual without relation to the nesting species.

In conclusion, there are several explanations for why birds join a mobbing behavior, in this note; three explanations for mobbing were recorded: Parental care, Altruistic or Contagion and Reciprocal altruism. It exhibits a complex

behavior among three bird species, showing that each mobbing behavior may have different explanation according to the join conditions of each individual in the aggregation.

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